Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Leveraging Africa's preparedness towards the next phase of the COVID-19 pandemic

Published Online
May 14, 2020
https://doi.org/10.1016/
S2214-109X(20)30234-5

The coronavirus disease 2019 (COVID-19) response in many African countries has been swift, progressive, and adaptable, despite resource limitations.[1] As the novel coronavirus infection spread through Wuhan (China) in January, 2020, African countries rapidly acquired de novo severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing capacity so that by March, most could confirm COVID-19. Airport screening began early and efforts to mitigate the spread of COVID-19 have typically emphasised case identification, contact tracing and isolation, handwashing and hand hygiene, and several social distancing and stay-at-home measures with, in some cases, lockdowns of exceedingly high risk areas (appendix). These strategies are likely to remain integral to disease mitigation until an effective vaccine is deployed or population immunity is sufficient to slow transmission. However, the application of COVID-19 mitigation strategies in sub-Saharan Africa needs careful and continued deliberation because of the unique socioeconomic dynamics in this region. In this Comment, we discuss some of these challenges and suggest potential, non-resource-intensive solutions.

Rapid urbanisation has led to an informal sector surge and consequent increase in people living in informal settlements and slums within African cities.[2] These communities are particularly susceptible to economic shock resulting from stay-at-home orders and lockdowns, which need to be tempered with food and basic necessity provisions.[2,3] Water tanks can be set up for handwashing and sanitation in these susceptible communities, as well as public toilets which could potentially serve as sentinel COVID-19 surveillance sites through periodic faecal matter sampling and testing.[4] An added layer of complexity is the multigenerational structure and large size of typical African households.[5] Household transmission is a substantial driver of SARS-CoV-2 spread in the community and multigenerational households might be prone to higher fatality.[6] Interrupting COVID-19 transmission is challenging because a substantial proportion of transmission occurs in the presymptomatic stage.[7]

Effective contact tracing, testing in the community, and targeted door-to-door surveillance in high-risk areas can help to identify preclinical COVID-19 patients early and isolate them to prevent onward transmission.[8] Mandatory involuntary quarantine could be deemed an impingement of civil liberties. However, voluntary isolation at financially compensated (ie, pre-paid for by government) designated facilities for those who cannot self-isolate at home, and for frontline health-care workers who risk exposing their families to COVID-19, could be instrumental to curbing transmission.

Sustained containment of COVID-19 will ideally prevent uncontrolled spread in the community and overwhelming of health-care capacity. Most African countries have a narrow margin for error because of weak health systems operating at near capacity outside of a pandemic and the need to maintain control of other infectious diseases.[1] Staggered periods of relaxed social distancing could avoid a large resurgence of cases while providing respite for economic activity. However, monitoring the effectiveness of non-pharmaceutical interventions and exercising flexibility in their implementation needs to be guided by continued surveillance through community testing. To meet this demand, testing capacity and implementation need to be scaled up substantially. Pooling of samples for quantitative PCR (qPCR) detection will be the most cost-effective approach, with one study showing that a SARS-CoV-2-positive sample could be detected by qPCR in a pool of up to 31 samples.[9] Scientists from Harvard (MA, USA) and the Broad Institute (MA, USA) are developing a low-technology framework to guide sample pooling strategies on the basis of the number of samples collected and testing capacity.

Technological advances in COVID-19 testing can also be leveraged to scale up testing. The newly approved Xpert Xpress SARS-CoV-2 (Cepheid, Sunnyvale, CA, USA) cartridge can provide a result within 45 min.[10] Because most control programmes for tuberculosis and HIV in Africa have GeneXpert modules and trained laboratory scientists, this technology can be easily deployed. However, in areas with high disease burden, existing GeneXpert modules are already overwhelmed. Additional modules must be procured to prevent existing control programmes being derailed. Evaluation and field testing of other portable rapid diagnostic

See Online for appendix

tools needs to start urgently to make COVID-19 testing accessible in places without qPCR capacity.

The high burden of endemic infectious disease in sub-Saharan Africa, and ongoing Lassa fever and Ebola outbreaks in Nigeria and DR Congo, mean that the COVID-19 response has an unusual and precarious context. This context emphasises the need to use cross-beneficial mitigating strategies and to maintain broad-based disease surveillance and vaccination programmes through the pandemic. Beyond COVID-19, Africa needs to continue to harness scientific advances to enhance health and productivity and equitably towards meeting the Sustainable Development Goals.

We declare no competing interests.

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